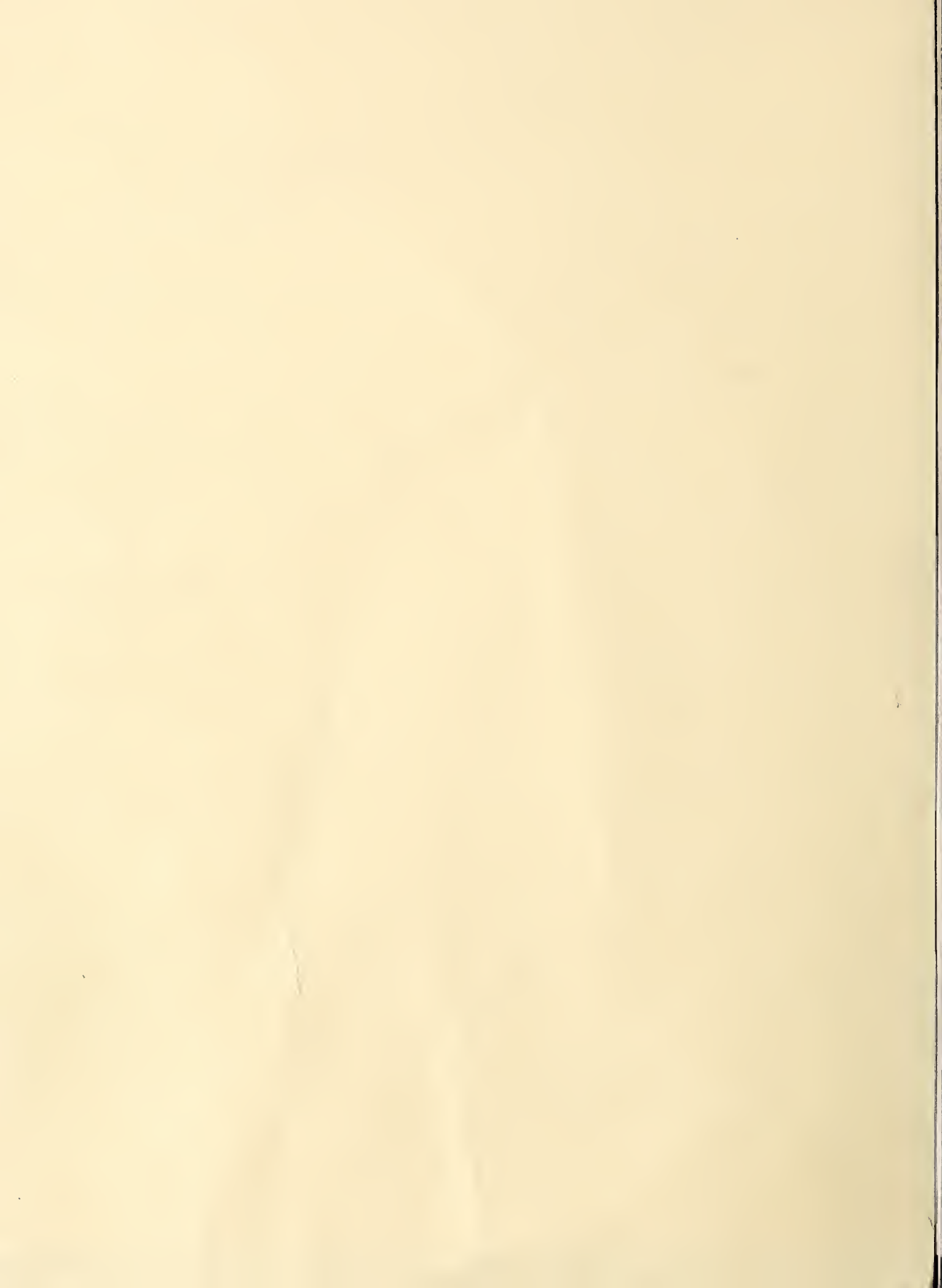


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United States
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Soil
Conservation
Service

Spokane,
Washington



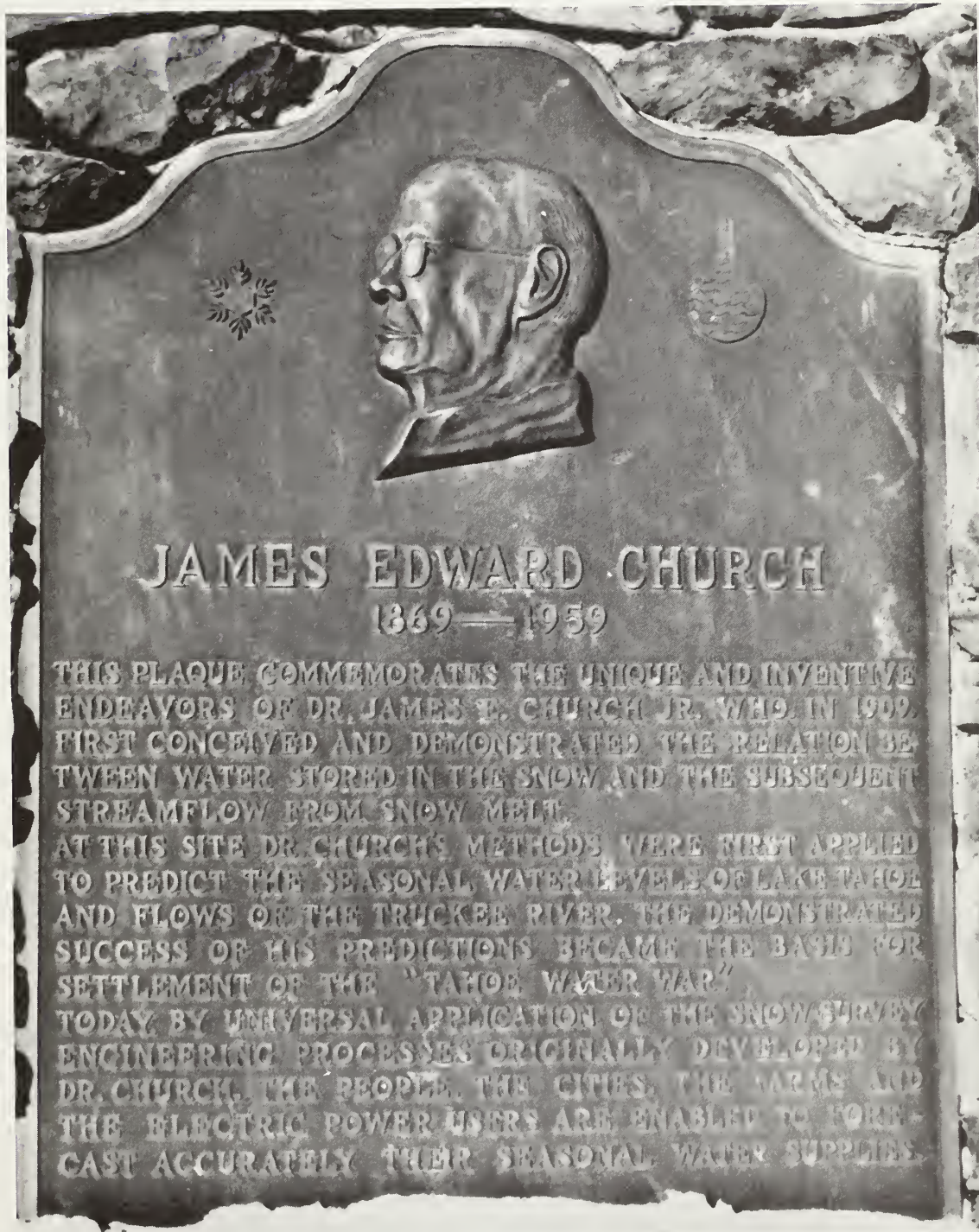
Reserve

Washington Water Supply Outlook

JANUARY 1, 1989

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1989



Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Soil Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

An error is associated with each forecast, and this error decreases as the season progresses and more data becomes available. To express the range of error that can be expected, "most probable" forecasts are issued along with a range representing a "reasonable minimum" and a "reasonable maximum". Actual streamflow can be expected to fall within this range in eight out of ten years. Additionally two specific scenarios are provided based on the assumption that subsequent precipitation will be "wet", above average, or "dry", below average.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola Ave., Suite 200, Phoenix, AZ 85012
Colorado	2490 West 26th Ave., Building A, 3rd floor, Denver, CO 80211
Idaho	3244 Elder Street, Room 124, Boise, ID 83705
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	1201 Terminal Way, Room 219, Reno, NV 89502
New Mexico	517 Gold Ave. S.W., Room 3301, Albuquerque, NM 87102-3157
Oregon	1220 Southwest 3rd Ave., Room 1640, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	W. 920 Riverside, Room 360, Spokane, WA 99201-1080
Wyoming	Federal Building, 100 "B" Street, Room 3124, Casper, WY 82601

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 248, Portland, OR 97209-3489.

Water supply reports published by other agencies:

California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A3V1; Alberta, Environment Technical Services Division, 9820 106th St., Edmonton, Alberta T5K 2J6.

Washington Water Supply Outlook

and

Federal — State — Private Cooperative Snow Surveys

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

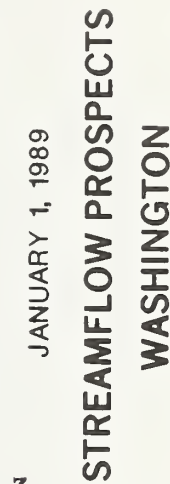
Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

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JANUARY 1986 4-R-39641
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GENERAL OUTLOOK

SUMMARY:

The 1989 water year precipitation is near normal. Runoff for 1989 is forecasted to be average over most of Washington. 1988 streamflow continued much below normal over the state. December streamflows were below average except in the Chelan River. The snowpack, except in the Walla Walla Basin, is below average. Reservoir storage remains below normal at the major irrigation projects throughout the state, with the reservoirs in the Yakima Basin much below normal. Temperatures varied over the state in December with the Okanogan three degrees above normal and the Yakima three degrees below.

NOTE: The terms "normal " and "average" as used in this publication, are the same.

SNOWPACK:

Only a few manual snow courses are read on January 1, the snowpack averages were taken mainly from 36 SNOTEL sites. Most areas of Washington are below normal, with only the Walla Walla basin at 116% above average. The West slopes of the Cascade Mountains are at 85%, and the Eastern slopes of the Cascade Mountains are at 83% of normal. Maximum snow cover is at the Paradise SNOTEL site with 31 inches of water content on the ground, this site normally would have 30 inches of water content. There are three snow sites that have been removed from the system, they are Plains of Araham and Mirror Lake SNOTEL's and Freezeout meadows snow course. Two new SNOTEL sites have been installed, Miners Ridge in the Chelan Basin and Thunder Basin in the Skagit Basin and are providing information.

PRECIPITATION:

The water year started with October being very dry followed by much above normal November precipitation. December precipitation continued the yo-yo effect and was much below normal. Water year to date values vary over the state as follows, Okanogan at 77%, Walla Walla at 73 %, and the Chelan at 95 % of normal. Above average basins include North Puget at 108%, White-Green at 111% and the Yakima at 101%. December precipitation values from the National Weather Service data for Washington showed the Olympic Basin with 81% of normal for the best average in the state. Other values around the state include 61% in the Spokane Basin, 51% in the Yakima Basin and 48% in the Wenatchee Basin.

RESERVOIRS:

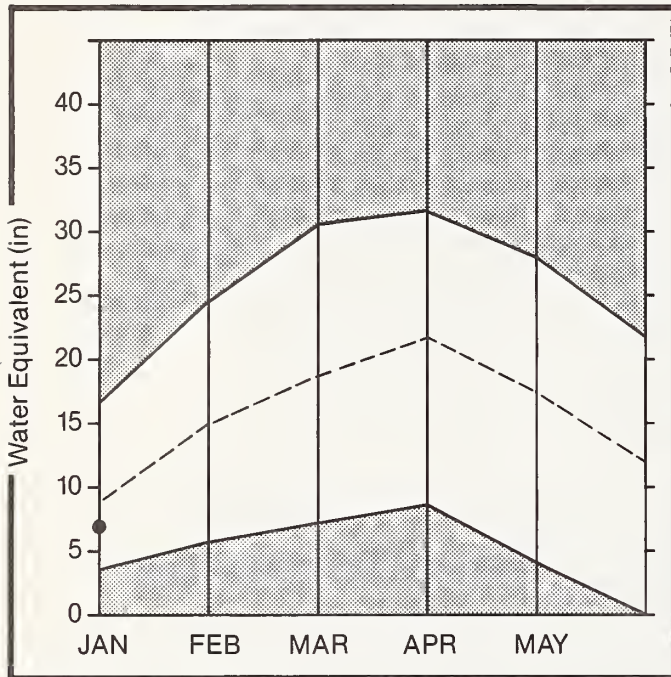
Reservoir storage in the Yakima Basin was 401,500 acre feet, 69% of average. Other major reservoir storage include Roosevelt at 50% of normal. Banks Lake is at 107% and the Okanogan reservoirs at 104% of January 1 average. The power reservoirs contain the following: Coeur d'Alene Lake 118,200 acre feet or 57% of capacity, Chelan Lake 418 200 acre feet at 110% of capacity and Ross Lake at 136% of capacity.

STREAMFLOW:



January streamflow forecasts vary from 87% in the Pend Oreille River to 101% in the Wenatchee River. December streamflows were below normal in most areas of Washington, continuing a trend established during the preceding summer. Streamflow varied from 24% on the Palouse River and the maximum of 101% from the Chelan River. On the west side of the Cascade Mountains, runoff from the Chehalis was 46%, the Skagit 78% and the Skykomish 79% of normal. The eastern slope of the Cascades runoff on the Yakima was 72% and the Okanogan at 65% of average. The Columbia River was 82% at the International Border and 87% below Priest Rapids. In Eastern Washington, the Spokane streamflow was 45% of normal and the Pend Orielle 59%.

SPOKANE

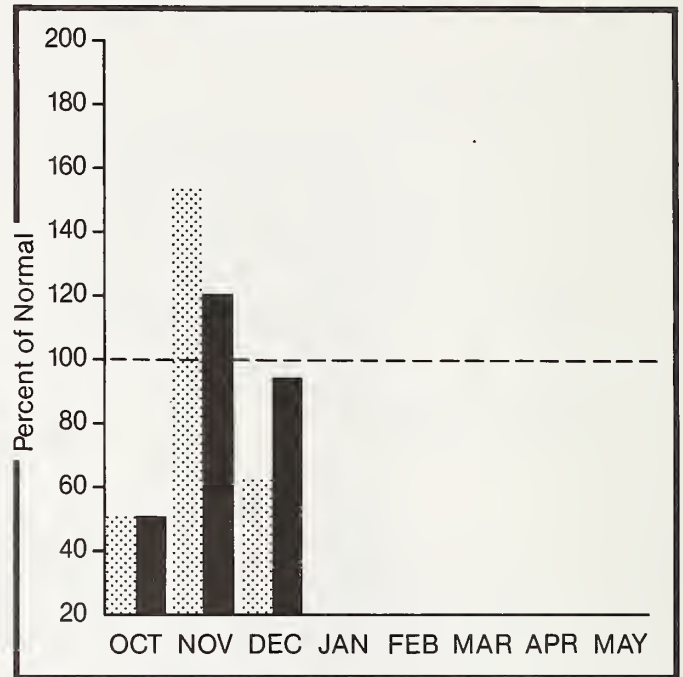
Mountain snowpack* (inches)





*Based on selected stations

Maximum  Average 
Minimum  Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

Forecasted runoff for the Spokane River Basin is 90% of normal. This forecast is based on a snowpack 78% of average and a water year to date precipitation value 93% of normal. Precipitation for December was 61% of normal. Streamflow during December on the Spokane River was 45% of average at Spokane. Storage in Coeur d' Alene Lake was 118,200 acre feet compared to 110,000 last year; average storage in Cd'A for January 1 was 207,700 acre feet. Maximum snow water occurred at the Lost Lake snow course with 66 inches of snow with 18.9 inches of water content. Temperatures averaged two degrees below normal during December.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

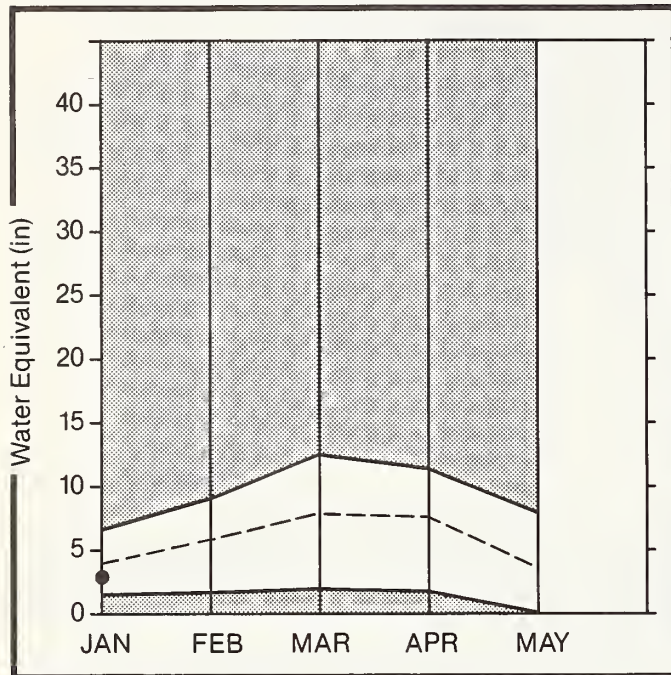
FORECAST POINT	FORECAST PERIOD	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	WET SUBS. (1000AF)	DRY SUBS. (1000AF)	REAS. MAX. (1000AF)	REAS. MIN. (1000AF)	25 YR. AVG. (1000AF)
SPOKANE nr Post Falls (2)	APR-SEP	2530	90	2870	2190	3970	1090	2820
	APR-JUL	2440	90	2770	2110	3830	1050	2723
SPOKANE at Long Lake	APR-JUL	2740	90			4690	1000	3045

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVG.			LAST YR.	AVERAGE
COEUR D'ALENE	291.2	118.2	110.0	207.7	Spokane River	14	158	77

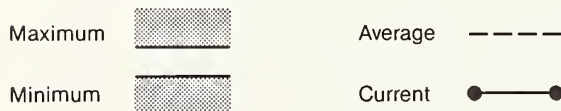
WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
 REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
 (1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
 (2) - Corrected for upstream diversions or changes in reservoir storage.

COLVILLE - PEND OREILLE

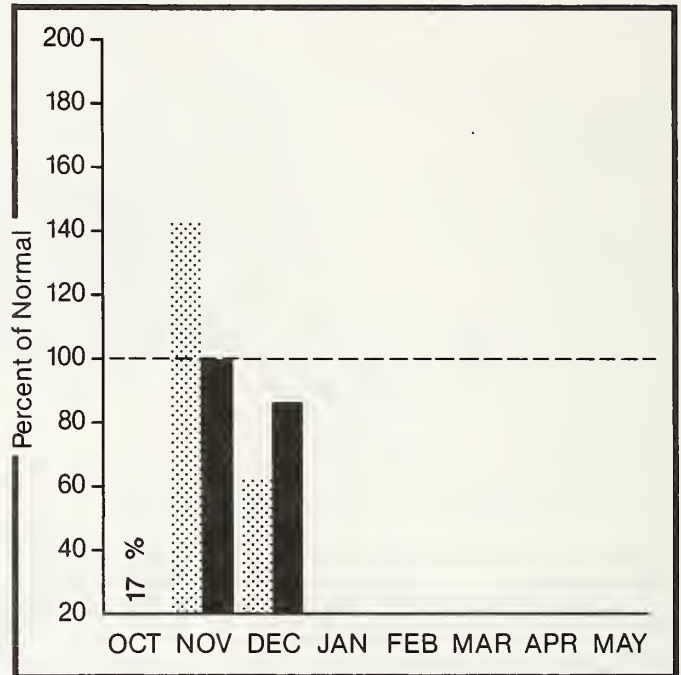
Mountain snowpack* (inches)



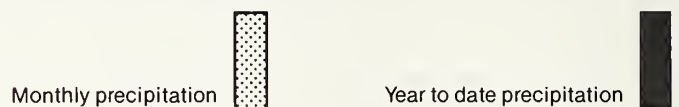
*Based on selected stations



Precipitation* (percent of normal)



*Based on selected stations



COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover basin-wide is 78% of average. Snowpack at Bunchgrass Meadow SNOTEL was 12.5 inches of water. Precipitation during December was 61% of average, bringing the water year to date to 85% of normal. Streamflows for December were 59% of average on the Pend Orielle River, 93% on the Kettle River and 82% on the Columbia River at the International Border. The forecast for the Pend Orielle River streamflows is 87% of normal for the summer. Other forecasts are the Kettle River 90%, and the Colville River 90% of normal for the summer runoff period.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

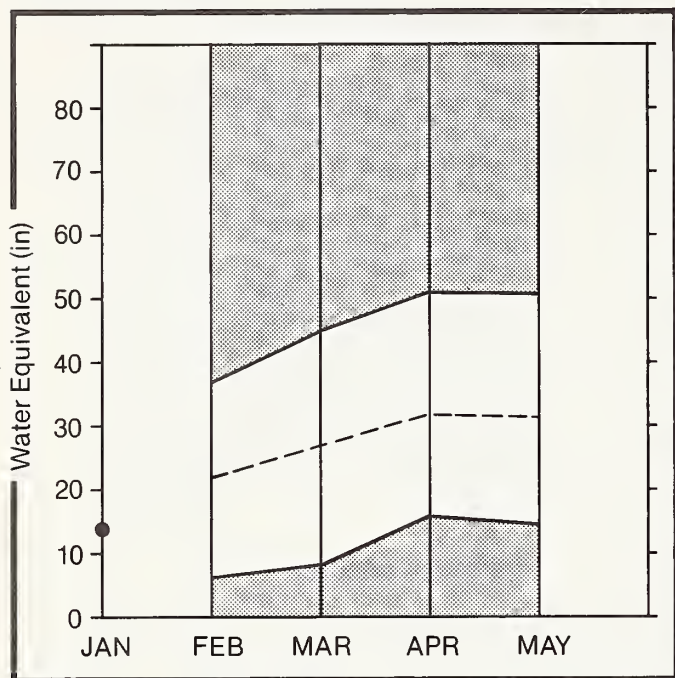
FORECAST POINT	FORECAST PERIOD	HIST PROBABLE (1000AF)	HIST PROBABLE (% AVG.)	WET SUBS. (1000AF)	DRY SUBS. (1000AF)	REAS. MAX. (1000AF)	REAS. MIN. (1000AF)	25 YR. AVG. (1000AF)
PEND OREILLE b1 Box Canyon (2)	APR-SEP	13200	87			18200	8190	15170
	APR-JUL	12100	87			16700	7510	13900
	APR-JUN	10400	87			14300	6450	11960
CHAMOKANE CK nr Long Lake	MAY-AUG	7.7	86			0.0	0.0	9.0
COLVILLE at Kettle Falls	APR-SEP	125	90	132	118	195	56	139
	APR-JUL	115	90			179	51	128
	APR-JUN	106	90			165	47	118
KETTLE nr Laurier	APR-SEP	1720	90	1990	1450	2560	900	1907
	APR-JUL	1630	90			2410	855	1807
	APR-JUN	1460	90			2160	765	1622
COLUMBIA at Birchbank (2)	APR-SEP	43800	99			54000	33600	44390
	APR-JUL	35000	99			43200	26800	35410
	APR-JUN	25400	99			31300	19200	25650
COLUMBIA at Grand Coulee Dam (2)	APR-SEP	62800	94			81400	41200	66460
	APR-JUL	52700	95			67700	37700	55730
	APR-JUN	41200	95			52900	29500	43420

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	THIS YEAR	LAST YEAR	AVG.	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE
ROOSEVELT	5232.0	2293.6	3762.4	4547.9		Colville River	0	0 0
BANKS	715.0	672.2	664.2	618.3		Pend Oreille River	10	149 87
						Kettle River	2	103 71

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
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OKANOGAN AND METHOW

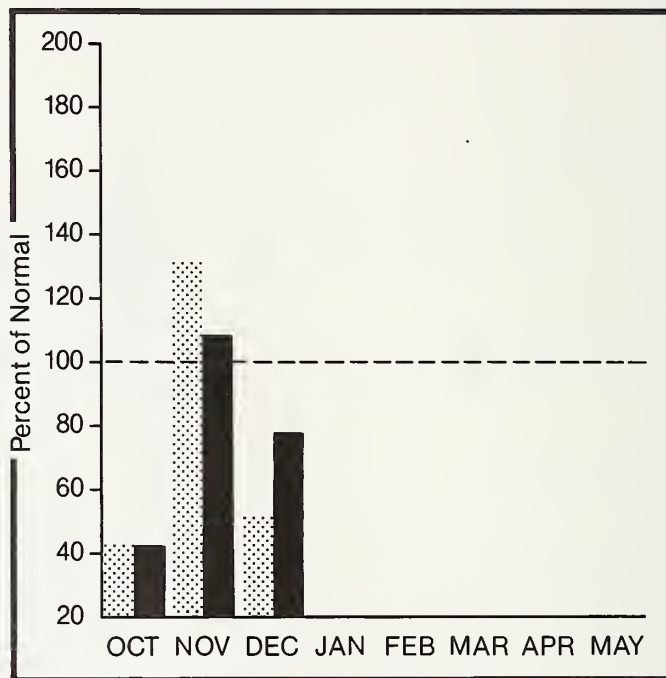
Mountain snowpack* (inches)



*Based on selected stations

Maximum Average Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover as of January 1 is 82% of average on the Okanogan-Methow Basin. Maximum snow water occurred at the Harts Pass SNOTEL, elevation 6500 feet, with 19.3 inches of water. December precipitation in the Okanogan was 51% of normal, with water year to date 77% of average. Temperatures were three degrees above normal for December. Storage in the Conconully Reservoirs is 14,000 acre feet, which is 57% of capacity and 104% of January 1 average. Summer runoff forecasted for the Okanogan River is 96% of normal. The Similkameen River 100% and the Methow River is 95% of normal. Okanogan River streamflow was at 65% of average for December, while the Similkameen River averaged 61%.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	WET SUBS. (1000AF)	DRY SUBS. (1000AF)	REAS. MAX. (1000AF)	REAS. MIN. (1000AF)	25 YR. AVG. (1000AF)
SIMILKAMEEN R. nr Nighthawk	APR-SEP	1430	100			2200	670	1432
	APR-JUL	1330	100			2050	625	1333
	APR-JUN	1120	99			1730	520	1128
OKANOGAN R. nr Tonasket	APR-SEP	1600	96			2560	655	1661
	APR-JUL	1440	96			2310	600	1501
	APR-JUN	1200	96			1930	495	1255
METHOW RIVER nr Pateros	APR-SEP	935	95			1440	425	980
	APR-JUL	860	95			1330	390	907
	APR-JUN	730	95			1140	330	769

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	THIS YEAR	LAST YEAR	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE
CONCONULLY LAKE (SALMON)	10.5	8.0	7.4	7.5	Okanoogan River	17	107 84
CONCONULLY RESERVOIR	13.0	6.0	4.8	5.9	Methow River	2	100 69

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.

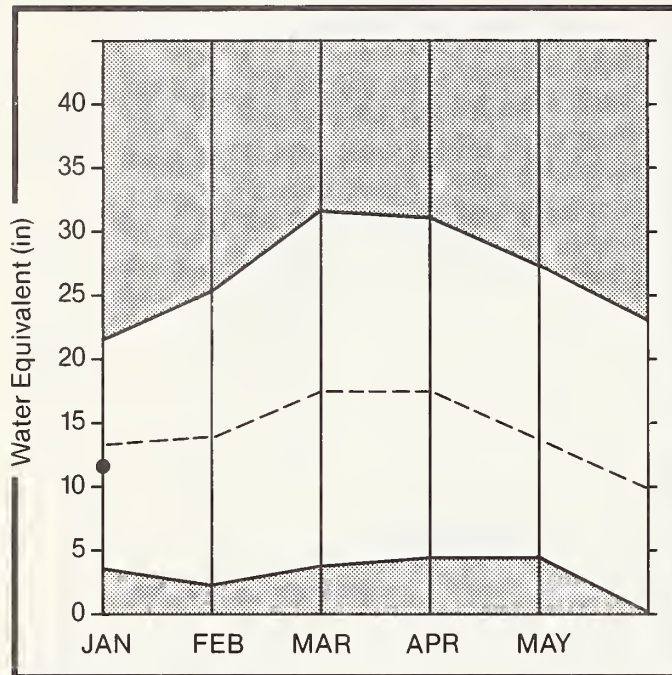
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WENATCHEE AND CHELAN

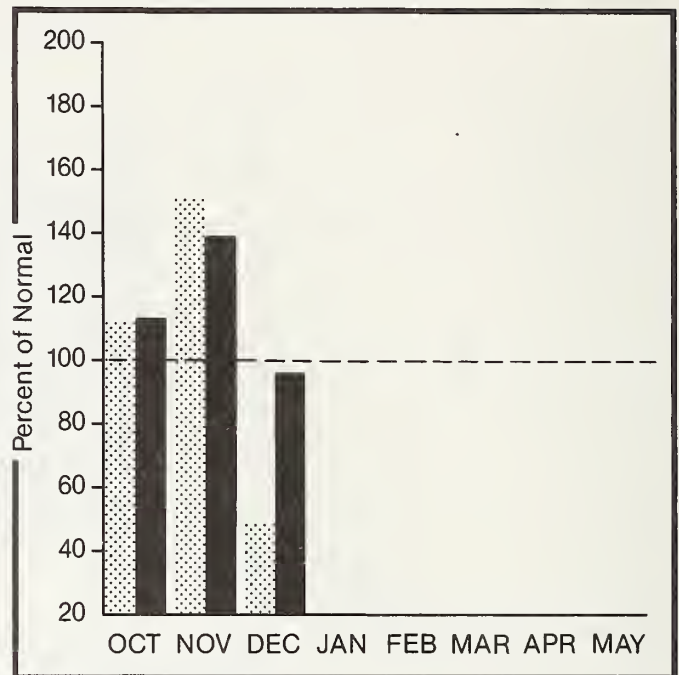
Mountain snowpack* (inches)



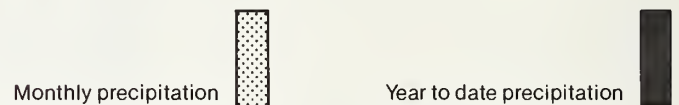
*Based on selected stations



Precipitation* (percent of normal)



*Based on selected stations



WENATCHEE AND CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

Runoff for the Wenatchee and Stehekin River is forecast to be 101% of normal for the summer. Forecasts in the Chelan River runoff are for 98% average. Stemilt and Icicle are forecast 99%. December streamflow within the basin was 86% of normal on the Wenatchee and 101% on the Chelan River. Precipitation during December was 51% of normal in the basin and 101% from October 1 to January 1. Reservoir storage in Lake Chelan is 418,200 acre feet or 110% of January 1 average and 62% of capacity. Snowpack in the Wenatchee-Chelan Basin is 87% of normal. Lyman Lake SNOTEL had the most snow water with 27.1 inches on January 1.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	HIST PROBA (1000AF)	HIST PROBA (% AVG.)	WET SUBS. (1000AF)	DRY SUBS. (1000AF)	REAS. MAX. (1000AF)	REAS. MIN. (1000AF)	25 YR. AVG. (1000AF)
CHELAN RIVER at Chelan 1	APR-SEP	1160	98	1290	1030	1500	805	1182
	APR-JUL	1020	98	1180	865	1320	710	1040
	APR-JUN	795	98	935	655	1040	560	815
STEHEKIN R. at Stehekin	APR-SEP	850	101	960	750	1060	640	844
	APR-JUL	720	101	820	635	900	540	714
	APR-JUN	545	101	625	475	680	410	541
ENTIAT RIVER nr Ardenvoir	APR-SEP	230	99	265	197	300	160	233
	APR-JUL	220	100	255	189	285	154	221
	APR-JUN	171	100	197	147	220	120	171
WENATCHEE RIVER at Plain	APR-SEP	1280	101	1470	1100	1740	825	1270
	APR-JUL	1120	101	1290	975	1520	720	1113
	APR-JUN	910	101	1040	705	1230	585	899
STEMILT nr Wenatchee (miners in)	MAY-SEP	137	99			187	87	138
ICICLE CREEK nr Leavenworth	APR-SEP	365	99	430	300	500	230	370
	APR-JUL	335	99	390	275	455	215	340
	APR-JUN	265	98	310	215	360	168	270
COLUMBIA R. b1 Rock Island Dam 2	APR-SEP	69300	96			89500	49100	72250
	APR-JUL	58600	96			75700	41500	61050
	APR-JUN	45800	96			59200	32400	47730

RESERVOIR STORAGE

(1000AF)

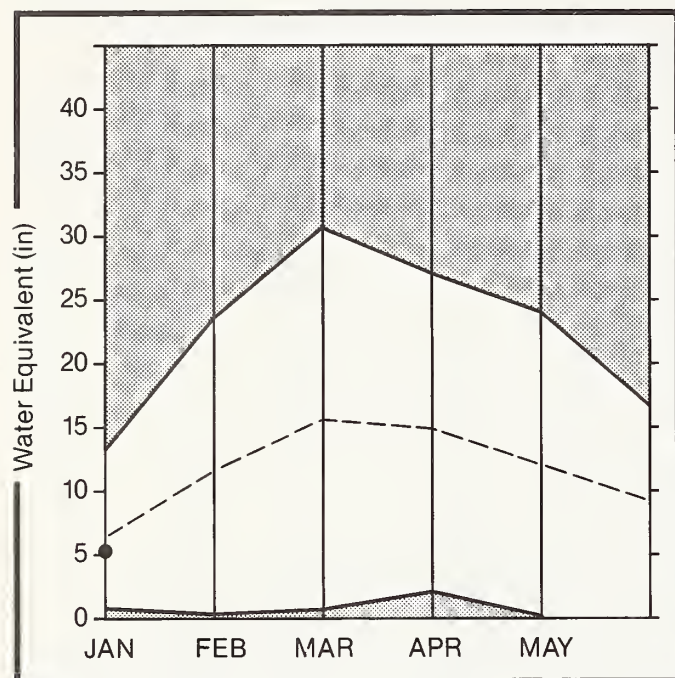
WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE	
		THIS YEAR	LAST YEAR	AVG.			LAST YR.	AVERAGE
CHELAN LAKE	676.1	418.2	312.8	378.7	Chelan Lake Basin	2	99	97
					Entiat River	0	0	0
					Wenatchee River	3	100	87
					Colockum Creek	1	55	63
					Squilchuck Creek	0	0	0
					Stemill Creek	0	0	0

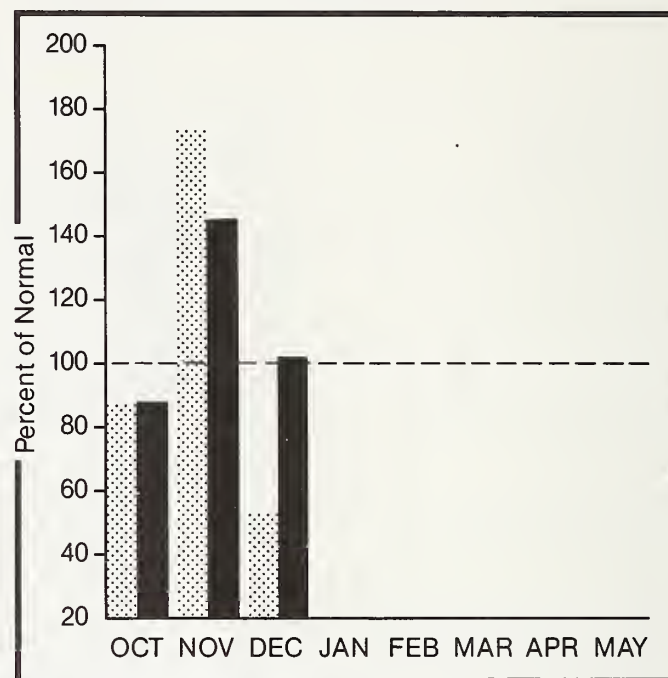
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YAKIMA

Mountain snowpack* (inches)



Precipitation* (percent of normal)

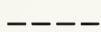


*Based on selected stations

Maximum



Average



Minimum



Current



*Based on selected stations

Monthly precipitation



Year to date precipitation



YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

December reservoir storage for the five major reservoirs was at 401,500 acre feet or 69% of normal. Streamflow for the Yakima Basin was 72% of normal. Forecasts for the Yakima Basin runoff vary throughout the basin as follows: the Yakima river at Cle Elum 99%, Naches River 92%, the Yakima River at Parker 94% and Ahtanum Creek 87%. Snowpack is 82% of average in the Yakima Basin based upon 17 snow course and SNOTEL readings. December precipitation was 51% of normal and 101% for the water year to date. Temperatures were three degrees below the December average.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAKFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	WET SUBS. (1000AF)	DRY SUBS. (1000AF)	REAS. MAX. (1000AF)	REAS. MIN. (1000AF)	25 YR. AVG. (1000AF)
YAKIMA RIVER at Martin 1	APR-SEP	130	96	149	111	153	108	136
	APR-JUL	121	96	139	103	141	101	126
	APR-JUN	108	96	121	95	126	90	112
YAKIMA RIVER at Cle Elum 2	APR-SEP	940	99	1210	675	1090	790	951
	APR-JUL	840	99	1070	605	975	705	846
	APR-JUN	725	99	930	525	845	605	735
YAKIMA RIVER nr Parker 2	APR-SEP	1950	94	2370	1540	2570	1330	2075
	APR-JUL	1750	94	2120	1410	2330	1190	1862
	APR-JUN	1540	94	1890	1240	2050	1050	1643
KACHESS RIVER nr Easton 1	APR-SEP	123	92	162	84	148	100	133
	APR-JUL	105	92	138	72	127	87	114
	APR-JUN	94	92	124	64	113	78	102
CLE ELUM RIVER nr Poslyn 1	APR-SEP	460	100	600	315	540	380	459
	APR-JUL	420	101	540	290	490	350	417
	APR-JUN	355	101	455	245	415	295	353
BUMPING RIVER nr Nile 1	APR-SEP	135	97	173	99	178	93	139
	APR-JUL	124	97	165	86	162	86	128
	APR-JUN	103	97	131	75	137	70	106
AMERICAN RIVER nr Nile	APR-SEP	115	95	154	77	151	79	121
	APR-JUL	106	95	142	72	140	72	112
	APR-JUN	89	95	118	61	117	61	94
TIETON RIVER at Tieton 1	APR-SEP	220	90	260	183	295	147	244
	APR-JUL	187	90	220	156	250	125	208
	APR-JUN	151	90	175	127	200	101	168
NACHES RIVER nr Naches 2	APR-SEP	790	92	980	600	1070	515	860
	APR-JUL	715	92	885	545	965	465	779
	APR-JUN	615	92	740	480	830	400	667
AHNTANUM CREEK nr Tampico 2	APR-SEP	41	87			62	19.9	47
	APR-JUL	37	86			56	17.6	43
	APR-JUN	32	86			49	15.4	37

RESERVOIR STORAGE (1000AF)

WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVG.			LAST YR.	AVERAGE
KEECHELUS	157.8	74.6	23.2	83.0	Yakima River	13	86	83
KACHESS	239.0	74.5	31.5	159.1	Ahtanum Creek	2	82	101
CLE ELUM	436.9	176.3	24.7	230.2				
BUMPING LAKE	33.7	15.4	7.1	6.3				
RINROCK	198.0	60.7	36.8	102.1				

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.

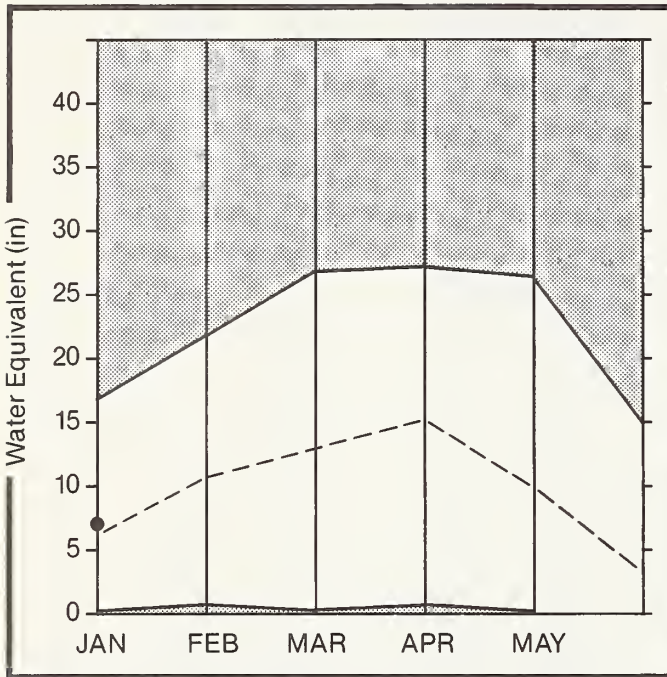
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.

(1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.





(2) - Corrected for upstream diversions or changes in reservoir storage.

WALLA WALLA

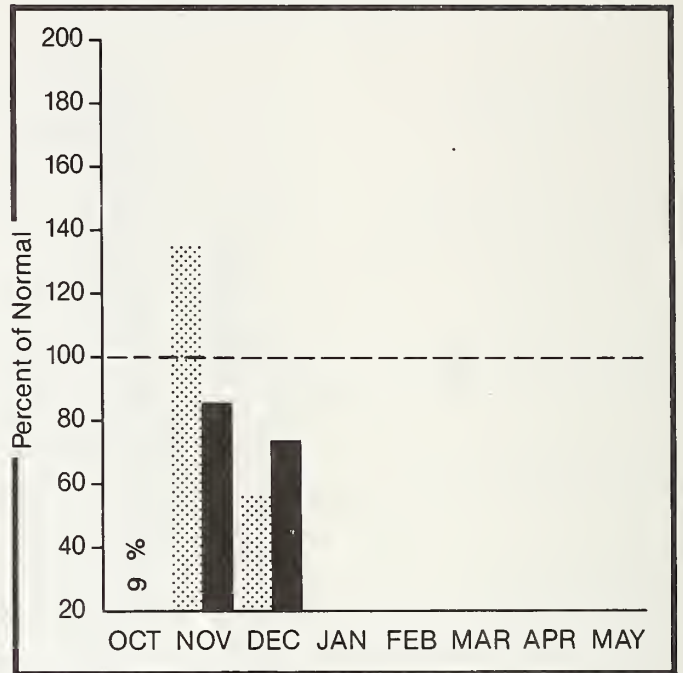
Mountain snowpack* (inches)





*Based on selected stations

Maximum  Average 
Minimum  Current 

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation  Year to date precipitation 

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

The forecast calls for 91% of average streamflow in the Walla Walla River for the coming summer. Streamflow for the Snake River is at 56% of normal for December and 47% on the Walla Walla River. December Precipitation was 55% of average and the water year to date precipitation has been 73% of normal. Snowpack in the Walla Walla River Basin is 116% of normal. Water content at the Touchet SNOTEL site was 19.6 inches on January 1 compared to 7.3 last year. Temperatures were one degree below average for December.

For more information contact your local Soil Conservation Service office.

WALLA WALLA RIVER BASIN

STREAMFLOW FORECASTS

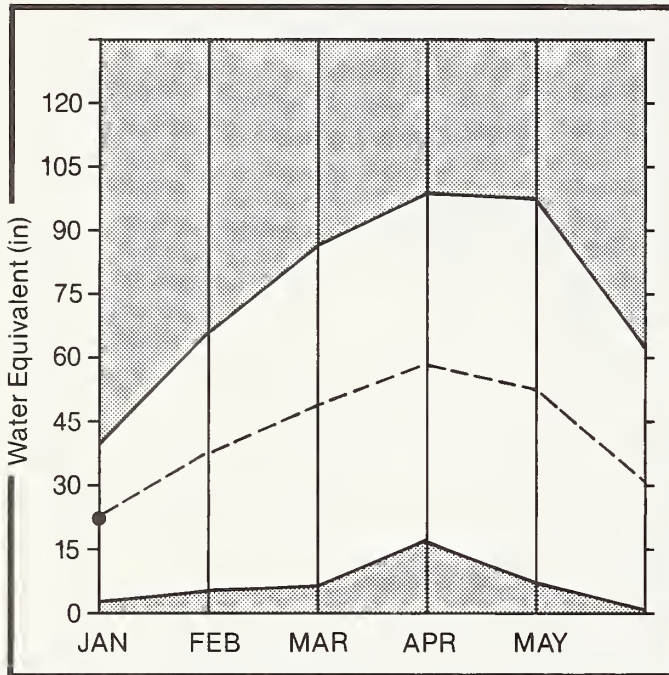
FORECAST POINT	FORECAST PERIOD	MDST PROBABLE (1000AF)	MDST PROBABLE (% AVG.)	WET SUBS. (1000AF)	DRY SUBS. (1000AF)	REAS. MAX. (1000AF)	REAS. MIN. (1000AF)	25 YR. AVG. (1000AF)
MILL CREEK at Walla Walla	APR-SEP	16.6	95	24	9.1	23	10.5	17.5
	APR-JUL	16.3	94	24	9.0	22	10.2	17.3
	APR-JUN	16.1	94	23	8.9	22	10.1	17.1
SF WALLA WALLA nr Milton Freewater	APR-JUL	50	91	67	34	64	35	55
COUSE CK nr Milton Freewater	APR-JUL	3.4	94	5.7	1.1	5.2	1.6	3.6
PINE CREEK nr Weston	APR-JUL	2.6	96	4.3	0.8	4.0	1.3	2.7
COLUMBIA R. at The Dalles 2	APR-SEP	94900	93			125000	65200	101801
	APR-JUL	81000	93			106000	55700	87110
	APR-JUN	65500	94			85900	45100	70470

RESERVOIR STORAGE (1000AF)		WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR LAST YEAR AVG.	WATERSHED	NO. COURSES AVG'D
			Mill Creek	1
				THIS YEAR AS % OF LAST YR. AVERAGE
				381 116

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
 REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
 (1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
 (2) - Corrected for upstream diversions or changes in reservoir storage.

COWLITZ AND LEWIS

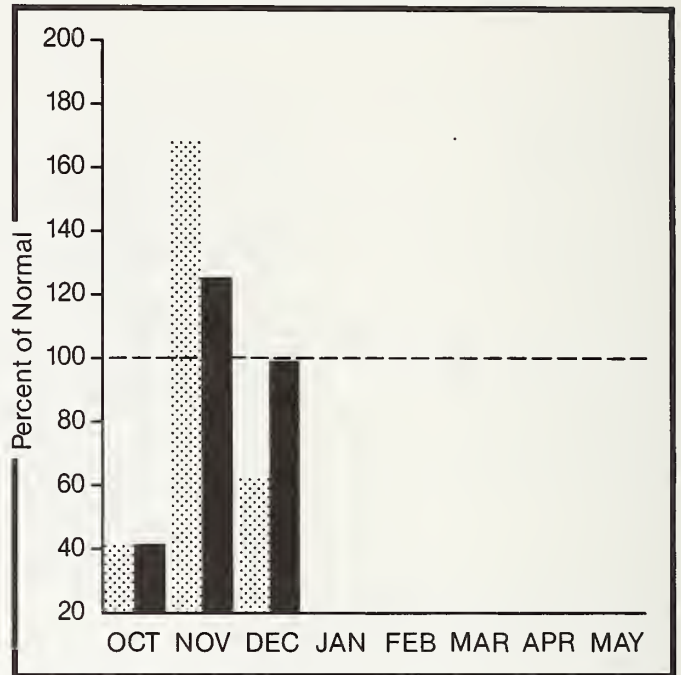
Mountain snowpack* (inches)



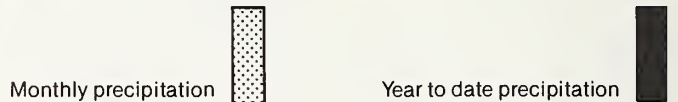
*Based on selected stations



Precipitation* (percent of normal)



*Based on selected stations



COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

January 1 snow cover for the Cowlitz-Lewis Basin is 98% of normal. The Paradise SNOTEL site has the maximum water content for the basin with a snowpack containing 31 inches of water on January 1. December precipitation was 62% of normal bringing the water year to date precipitation to 98% of average. Summer runoff forecasts for the Lewis River are 98% and for the Cowlitz River 95%. Temperatures were one degree above normal for December.

For more information contact your local Soil Conservation Service office.

COMLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

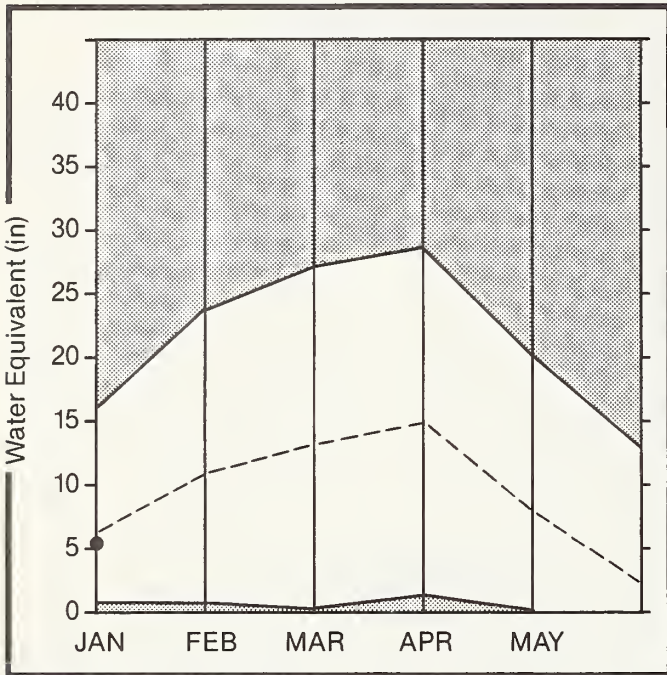
FORECAST POINT	FORECAST PERIOD	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	MET SUBS. (1000AF)	DRY SUBS. (1000AF)	REAS. MAX. (1000AF)	REAS. MIN. (1000AF)	25 YR. AVG. (1000AF)
LEWIS RIVER at Ariel 2	APR-SEP	1220	98	1470	945	1740	700	1244
	APR-JUL	1060	98	1280	830	1520	605	1084
	APR-JUN	940	98	1140	530	1340	540	958
COMLITZ R. bl Hayfield Dam 2	APR-SEP	1910	94	2950	935	2830	995	2036
	APR-JUL	1680	94	2590	840	2480	880	1782
	APR-JUN	1430	94	2210	730	2120	745	1524
COMLITZ R. at Castle Rock 2	APR-SEP	2540	95	14.2	14.2	3210	1870	2687
	APR-JUL	2230	95	4.2	4.2	2820	1640	2343
	APR-JUN	1910	95	15.9	15.9	2410	1410	2015

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF
		THIS YEAR	LAST YEAR	AVG.			LAST YR. AVERAGE
					Cowlitz River	1	94 78
					Lewis River	2	126 142

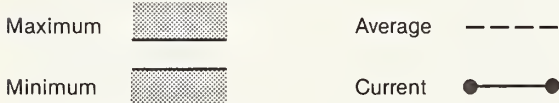
MET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
 REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
 (1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
 (2) - Corrected for upstream diversions or changes in reservoir storage.

WHITE - GREEN

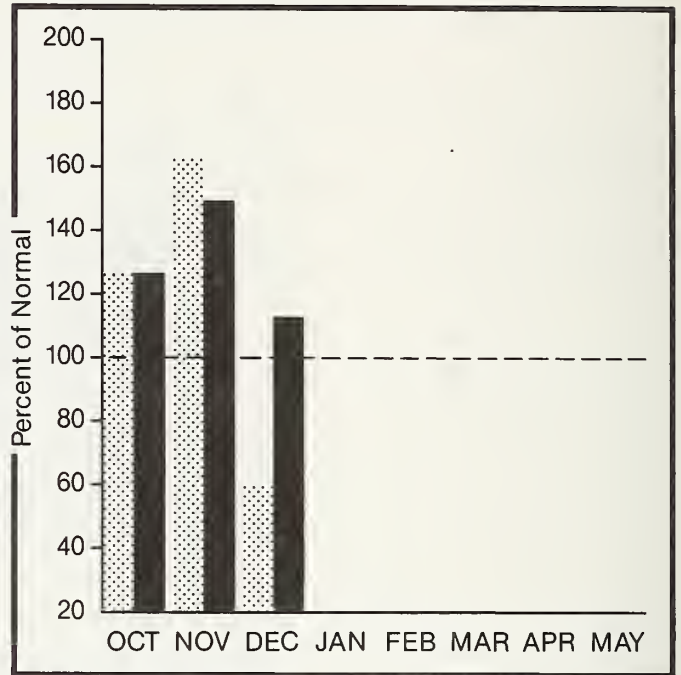
Mountain snowpack* (inches)



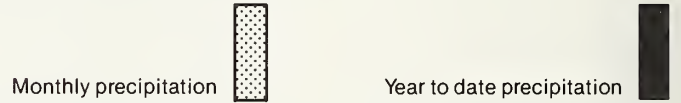
*Based on selected stations



Precipitation* (percent of normal)



*Based on selected stations



WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Summer runoff is forecasted to be 89% and 102% of normal on the Green and Cedar Rivers. Snow water content at the Morse Lake SNOTEL site was 20.8 inches on January 1. December precipitation was 58% of normal bringing the water year to date to 111% of average. Snowpack is 87% of normal for the basin. Temperatures were one degree above average for December.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

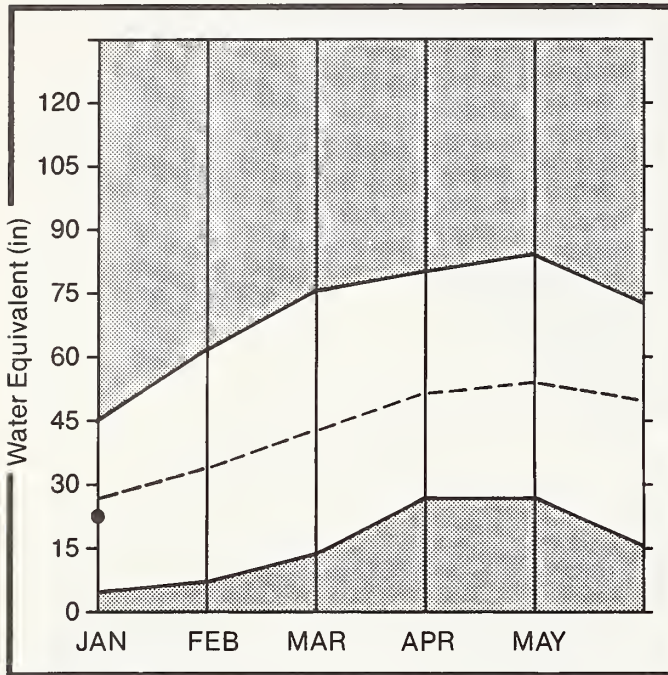
FORECAST POINT	FORECAST PERIOD	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	WET SUBS. (1000AF)	DRY SUBS. (1000AF)	REAS. MAX. (1000AF)	REAS. MIN. (1000AF)	25 YR. AVG. (1000AF)
GREEN RIVER bl Howard Hanson Dam 2	APR-SEP	260	89	325	190	360	158	291
	APR-JUL	235	90	290	170	325	144	261
	APR-JUN	210	89	265	156	295	127	236
CEDAR RIVER nr Cedar Falls	APR-SEP	95	102	147	43	128	62	93

RESERVOIR STORAGE		(1000AF)		WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE
		THIS YEAR	LAST YEAR	AVG.			
					White River	2	94 97
					Green River	5	136 102
					Cedar River	0	0 0

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
 REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
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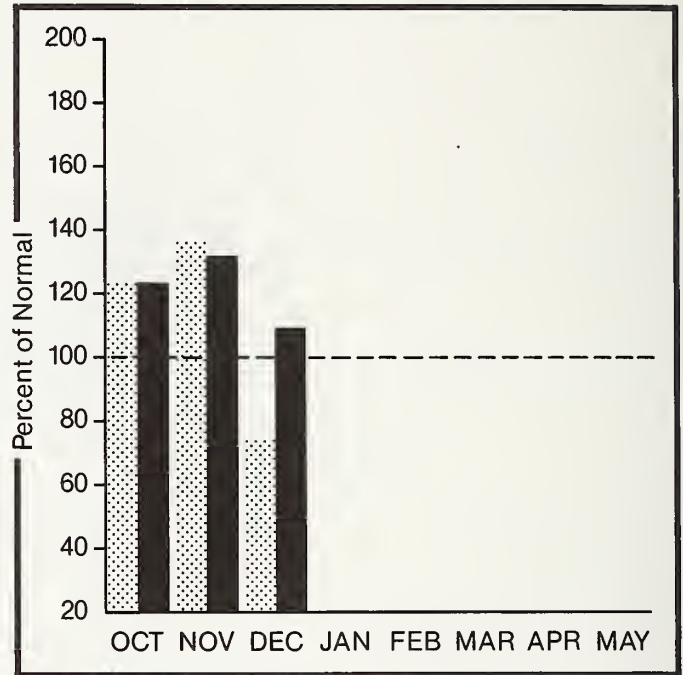
NORTH PUGET SOUND

Mountain snowpack* (inches)





*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum  Average 
Minimum  Current 

Monthly precipitation  Year to date precipitation 

NORTH PUGET SOUND RIVER BASIN

WATER SUPPLY OUTLOOK:

Streamflow on the Skagit River during December was 78% of average. Runoff for the Skagit River is forecasted to be 95% of normal. Reservoir storage is above average, with Ross Lake storing 1,066,000 acre feet as of January 1, 136% of capacity. Precipitation values for December were 73% of average with a water year to date at 108% of normal. Snow cover for January 1 in the basin is 84% of normal, with Harts Pass SNOTEL at 6500 feet in elevation having 19.3 inches of water content. Temperatures were one degree above average for December.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	HIST PROBABABLE (1000AF)	HIST PROBABABLE (% AVG.)	WET SUBS. (1000AF)	DRY SUBS. (1000AF)	REAS. MAX. (1000AF)	REAS. MIN. (1000AF)	25 YR. AVG. (1000AF)
SKAGIT RIVER at Newhalem 2	APR-SEP	2150	95	2440	1860	2740	1560	2264
	APR-JUL	1800	95	2030	1550	2290	1310	1891
	APR-JUN	1370	95	1560	1180	1740	995	1442

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE
ROSS	1404.1	1066.1	913.1	783.9	Skagit River	2	107 84
DIABLO RESERVOIR	90.6	86.2	86.4	---	Baker River	0	0 0
GORGE RESERVOIR	9.8	7.8	7.8	---	Snoqualmie River	0	0 0
					Skvkomish River	1	101 92

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.

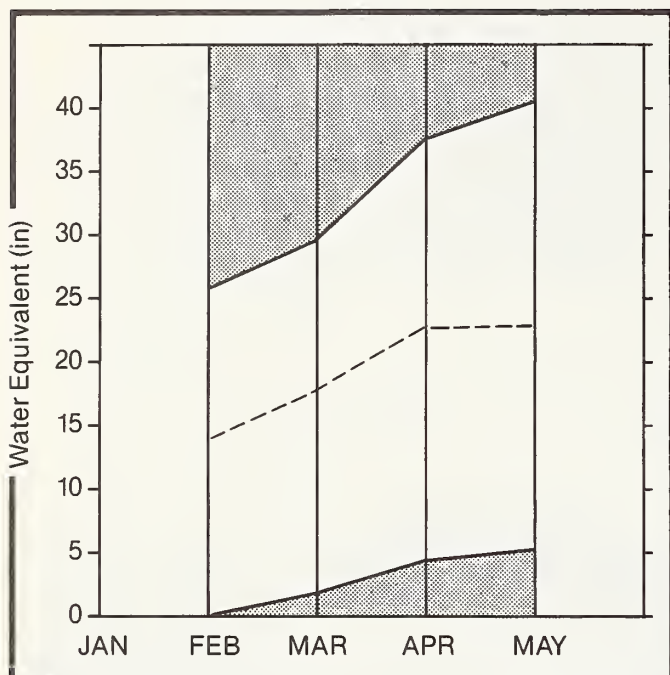
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.

(1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.

(2) - Corrected for upstream diversions or changes in reservoir storage.

OLYMPIC

Mountain snowpack* (inches)



*Based on selected stations

Maximum



Average



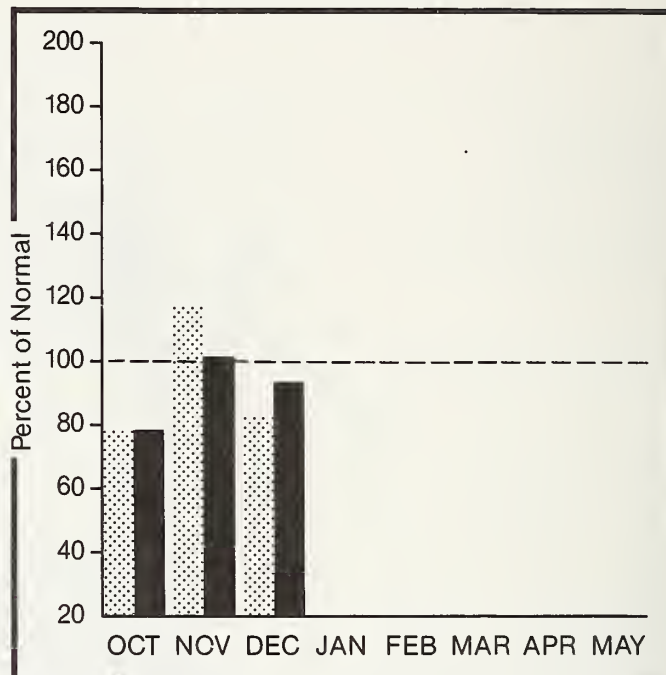
Minimum



Current



Precipitation* (percent of normal)

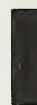


*Based on selected stations

Monthly precipitation



Year to date precipitation



OLYMPIC PENINSULA RIVER BASIN

WATER SUPPLY OUTLOOK:

The water year to date precipitation accumulation is 93% of normal. December precipitation was 81% of average. January 1 forecasts of runoff for streamflow in the basin are for 95% of average on the Dungeness River and 98% for the Elwah River. There are no snow courses read in the Olympic Basins for January 1. Because of the low water content in other areas of the state it is assumed that the water content is also low here. Temperatures were one degree above normal for December.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	WET SUBS. (1000AF)	DRY SUBS. (1000AF)	REAS. MAX. (1000AF)	REAS. MIN. (1000AF)	25 YR. AVG. (1000AF)
DUNGENESS RIVER nr Sequim	APR-SEP	151	95	173	130	183	119	159
	APR-JUL	122	95	141	101	148	96	129
	APR-JUN	92	95	106	80	111	73	97
ELWHA RIVER nr Port Angeles	APR-SEP	540	98	560	520	650	430	553
	APR-JUL	445	98	470	420	535	355	454

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF	
	I	THIS YEAR	LAST YEAR	AVG.			LAST YR.	AVERAGE
					Dungeness River	0	0	0
					Morse Creek	0	0	0
					Elwha River	0	0	0

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
 REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
 (1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
 (2) - Corrected for upstream diversions or changes in reservoir storage.

DATA CURRENT AS OF: 1/ 6/89 9:10:12

BASIN SUMMARY OF SNOW COURSE DATA

JANUARY 1989

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
PEND OREILLE RIVER						
BENTON MEADOW	2370	12/29/88	11	1.5	1.0	3.0
BENTON SPRING	4920	12/29/88	29	6.3	5.1	8.6
BUNCHGRASS MEADOWS	5000	12/30/88	---	12.9E	8.0	14.6
BUNCHGRASS MDWPILLOW	5000	1/01/89	---	12.5	7.9	16.2
LOOKOUT	5140	12/28/88	38	9.9	7.6	14.5
NELSON CAN.	3100	12/29/88	22	3.8	3.5	7.2
SCHWEITZER BOWL	4800	12/30/88	---	12.4E	9.9	13.8
SCHWEITZER RIDGE	6200	12/30/88	---	18.5E	15.7	21.3

KETTLE RIVER						
BIG WHITE MTN CAN.	5510	12/29/88	31	7.5	8.0	7.2
FARRON CAN.	4000	12/29/88	22	4.6	3.8	9.9

SPOKANE RIVER						
ABOVE BURKE	4100	12/28/88	---	6.7E	3.2	8.4
FOURTH OF JULY SUM	3200	12/28/88	15	2.8	2.7	3.7
LOOKOUT	5140	12/28/88	38	9.9	7.6	14.5
LOST LAKE	6110	12/27/88	66	18.9	11.1	25.2
MOSQUITO RIDGE	5200	12/30/88	---	13.2E	9.9	17.1
SHERWIN	3200	1/02/89	37	7.2	2.6	5.6
SUNSET	5540	12/30/88	---	10.1E	5.3	14.7

NEWMAN LAKE						
QUARTZ PEAK PILLOW	4700	1/01/89	---	11.4S	6.0	---
RAGGED RIDGE	3330	1/01/89	21	4.3	2.8	---

OKANOGAN RIVER						
BRENDA MINE CAN.	4800	12/30/88	26	5.0	4.3	6.5
BROOKMERE CAN.	3200	12/30/88	17	3.7	3.7	4.6
ENDERBY CAN.	6200	12/29/88	62	18.1	18.7	18.6
GREYBACK RES CAN.	5120	1/03/89	20	3.8	2.3	3.1
HAMILTON HILL CAN.	4890	12/29/88	20	4.3	3.4	8.4
HARTS PASS PILLOW	6500	1/01/89	---	19.3S	18.1	27.2
MCCULLOCH CAN.	4200	12/30/88	17	3.4	2.8	3.2
MISSION CREEK CAN.	5800	12/29/88	32	7.6	7.0	8.9
MT. KOBAY CAN.	5900	12/31/88	19	4.4	7.8	6.3
SALMON MDWS PILLOW	4500	1/01/89	---	4.2S	5.4	7.0
SILVER STAR MTN CAN.	6000	12/31/88	47	13.5	12.6	13.4
VASEUX CREEK CAN.	4600	12/28/88	11	1.6	1.9	2.7
WHITE ROCKS MTN CAN.	6000	12/30/88	38	11.1	10.7	11.6

METHOW RIVER						
HARTS PASS PILLOW	6500	1/01/89	---	19.3S	18.1	27.2
SALMON MDWS PILLOW	4500	1/01/89	---	4.2S	5.4	7.0

CHELAN LAKE BASIN						
LYMAN LAKE PILLOW	5900	1/01/89	---	27.1S	25.1	28.3
PARK CK RIDGE PILLOW	4600	1/01/89	---	20.1S	22.8	20.6
RAINY PASS PILLOW	4780	1/01/89	---	13.5S	---	23.2

WENATCHEE RIVER						
BLEWETT PASS#2PILLOW	4270	1/01/89	---	6.4S	8.8	11.5
LYMAN LAKE PILLOW	5900	1/01/89	---	27.1S	25.1	28.3
STEVENS PASS PILLOW	4070	1/01/89	---	17.4S	17.2	18.9

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
COLOCKUM CREEK						
TROUGH #2 PILLOW	5310	1/01/89	---	3.2S	5.8	5.1

YAKIMA RIVER						
AHTANUM R.S.	3100	12/28/88	16	3.2	3.3	3.6
BIG BOULDER CREEK	3200	12/28/88	28	7.6	7.8	7.2
BLEWETT PASS#2PILLOW	4270	1/01/89	---	6.4S	8.8	11.5
BUMPING LAKE	3450	12/30/88	16	3.4	7.3	6.5
BUMPING LAKE (NEW)	3400	12/30/88	24	5.9	8.7	8.0
CORRAL PASS PILLOW	6000	1/01/89	---	15.6S	14.5	15.5
FISH LAKE	3370	12/28/88	40	11.2	12.5	12.4
FISH LAKE PILLOW	3370	1/01/89	---	12.0S	11.6	15.1
GREEN LAKE PILLOW	6000	1/01/89	---	9.2S	11.8	8.7
GROUSE CAMP PILLOW	5380	1/01/89	---	9.1S	9.9	9.0
LAKE CLE ELUM	2200	12/29/88	7	1.5	3.0	4.2
MORSE LAKE PILLOW	5400	1/01/89	---	20.8S	24.4	22.0
STAMPEDE PASS PILLOW	3860	1/01/89	---	17.4S	---	23.6
SASSE RIDGE PILLOW	4200	1/01/89	---	11.8S	13.1	15.4
TUNNEL AVENUE	2450	12/27/88	20	5.3	6.5	8.7
WHITE PASS E.S.	4500	1/02/89	27	6.0	4.0	9.7
WHITE PASS ES PILLOW	4500	1/01/89	---	8.1S	8.6	10.4

AHTANUM CREEK						
AHTANUM R.S.	3100	12/28/88	16	3.2	3.3	3.6
GREEN LAKE PILLOW	6000	1/01/89	---	9.2S	11.8	8.7

MILL CREEK						
HIGH RIDGE PILLOW	4980	1/01/89	---	14.1S	3.7	12.2
TOUCHET #2 PILLOW	5530	1/01/89	---	19.6	7.4	---

LEWIS AND COWLITZ RIVERS						
JUNE LAKE PILLOW	3200	1/01/89	---	19.7S	11.1	11.6
LONE PINE PILLOW	3800	1/01/89	---	13.8S	9.9	16.9
POTATO HILL PILLOW	4500	1/01/89	---	8.8S	10.3	12.6
SHEEP CANYON PILLOW	4050	1/01/89	---	22.0S	12.2	18.1
SPENCER MDW PILLOW	3400	1/01/89	---	13.8S	---	11.7
SPIRIT LAKE PILLOW	3100	1/01/89	---	6.9S	---	5.9
STRAWBERRY L. PILLOW	3280	1/01/89	---	17.9S	19.6	21.7
SURPRISE LKS PILLOW	4250	1/01/89	---	27.0S	---	21.8
WHITE PASS E.S.	4500	1/02/89	27	6.0	4.0	9.7
WHITE PASS ES PILLOW	4500	1/01/89	---	8.1S	8.6	10.4

WHITE RIVER						
CORRAL PASS PILLOW	6000	1/01/89	---	15.6S	14.5	15.5
MORSE LAKE PILLOW	5400	1/01/89	---	20.8S	24.4	22.0

GREEN RIVER						
COUGAR MTN. PILLOW	3200	1/01/89	---	6.3S	6.8	11.2
STAMPEDE PASS PILLOW	3860	1/01/89	---	17.4S	---	23.6

SKYKOMISH RIVER						
STEVENS PASS PILLOW	4070	1/01/89	---	17.4S	17.2	18.9

SKAGIT RIVER						
HARTS PASS PILLOW	6500	1/01/89	---	19.3S	18.1	27.2
LYMAN LAKE PILLOW	5900	1/01/89	---	27.1S	25.1	28.3
RAINY PASS PILLOW	4780	1/01/89	---	13.5S	---	23.2

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canada: Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia

States: Washington State Department of Ecology
Washington State Department of Natural Resources

Federal: Department of the Army
Corps of Engineers
U.S. Department of Agriculture
Forest Service
U.S. Department of Commerce
NOAA, National Weather Service
U.S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service
Bureau of Indian Affairs

Local: City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.
Colville Confederated Tribes
Spokane County

Private: Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

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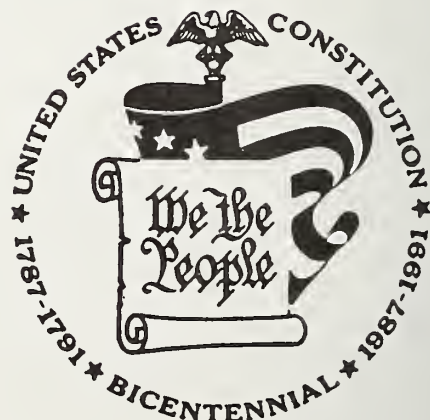
**Washington
Water Supply Outlook**

and

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SOIL CONSERVATION SERVICE



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